GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Land Protection Branch
4244 International Parkway
Suite 104
Atlanta, Georgia 30354
404-362-2537

April 20, 2021

Mr. Steven Ingle
Twin Pines Minerals, LLC
2100 Southbridge Pkwy, Suite 540
Birmingham, AL 35209

SUBJECT: **Twin Pines Minerals, LLC Permit Coordination Comments**
Mine Name: Saunders Demonstration Mine
County: Charlton

Dear Mr. Ingle:

The Environmental Protection Division (EPD) has reviewed the Surface Mining Application, Mining Land Use Plan and Exhibits submitted on November 13, 2020; Groundwater Withdrawal Application submitted on December 9, 2020; Technical Comments, Soil Amendment Plan and the Subsurface Continuity of Humate-Bearing Sands in the Surficial Aquifer document submitted on January 25, 2021; and the Surface Mining Provisions Addendum submitted on February 17, 2021.

EPD has provided comments of the submittals and are enclosed. Please submit responses to me at jamie.lancaster1@dnr.ga.gov or by submitting hard copies to Attn: Jamie Lancaster, 4244 International Parkway, Suite 104, Atlanta, GA 30354.

If you have any questions, please contact me at 404.362.4888.

Sincerely,

Jamie Lancaster

Jamie Lancaster
Unit Manager
Surface Mining Unit

cc: TTL

Enclosure

Twin Pines Permit Coordination Document
Charlton County: Saunders Demonstration Mine
April 14, 2021

1. **Surface Mining Application and Mining Land Use Plan Review Comments by Surface Mining Unit (Contains most MLUP sheets)**

   a. Please add Mine ID No. 2073 to each sheet or Figure.
   b. Land Use Development Plan
      i. On page 5 in the last paragraph with the sentence starting "In the PCP…", please ensure that "spiral concentrate" is the correct language.
      ii. On page 6, Section VI, please be aware that a radioactive handling permit may be necessary. Surrounding mines have come across a need for one due to uncovering natural occurring radioactive materials.
      iii. In Section X, which begins on page 10, please edit this section to note that any additional mining operations not included in this demonstration mine will require a new set of permits and a full permitting process.
   c. Figure 3: Proposed Site Layout
      i. There are tailing stockpiles in the southwest corner. Please provide detail regarding runoff from this stockpile area. Will the stockpile move along with mine progression?
      ii. Please add a note or another page for mine progression and how the portable conveyors will move along with the stockpiles. Will the stockpiles move along with the conveyors?
      iii. Add a construction exit to the entrances of the plant and pumping well. Both are off Hwy 94. Please provide details of the construction exits on the detail sheet.
      iv. Please label each pumping well.
   d. Figure 5: Process Flow Diagram
      i. Add "permitted outfall" to heavy rain event discharge arrow.
      ii. Add a description of how the material is transported from the Mineral Concentrate Stockpile to the Mineral Separation Plant or Direct Sale, e.g. trucking or conveyor. Show any piping between the Mineral Separation Plant and the main Permit Area. Does Mineral Separation Plant need to be on Surface Mine Permit? If so, please show or explain how the material is being transported to the Mineral Separation Plan. (ie. From Figure 3&5).
   e. Figure 6B: Mining Profile/Cross-section (Typical)
      i. Please note the average timeframe that this backfilling process will take. This may be a range.
   f. Figure 10: Post Mining Restoration Plan
      i. Please rename Figure 10 to Reclamation Plan.
      ii. On a separate sheet, if necessary, provide, to scale, the North South cross section trace through the permitted reclaimed mine that includes the appropriate parcels, berms, undisturbed buffers, Georgia Highway 94, and Norfolk Southern Railroad. Also include, to scale, the East West cross section that includes undisturbed buffers, T-Model and Trail Ridge Roads.
      iii. Please change Note 3 to "all disturbed areas will be permanently vegetated".
      iv. Add a "Note 4" to specify whether both pumping wells will remain or whether they will be properly abandoned.
      v. Please include all non-jurisdictional wetlands that will be affected and how they will be reclaimed.
      vi. Please state whether the berm will remain after reclamation.

vii. Add a grass/tree symbol to the areas being vegetated. Please identify what type of vegetation will be used and include a schedule indicating planting, active growing season, stable, and mature growth.

2. **Soil Amendment Plan Comments by: Surface Mining Unit and James L. Kennedy, Ph.D., P.G**

   a. The Soil Amendment Plan should not be a separate document. Please add this information to the Reclamation Plan.
   b. On Page 1 in Paragraph 4 Item 1: It is said that soil borings for conformation (sic) of the presence or absence of consolidated black sands will be drilled on a 250-foot (ft) by 250-ft grid. Each grid will be 250 ft x 250 ft = 62,500 ft^2, or 62,500 ft^2/43,560 ft^2/acre = 1.43 acre. At least two samples should be collected from each 250 ft x 250 ft grid for a sample spacing of 1 sample for each 0.715 acre. As an alternative, the proposed mine site can be divided into a 200 ft x 200 ft grid and soil samples will be taken in the middle of each grid. This would be a sample spacing of 200 ft x 200 ft = 40,000 ft^2, or 40,000 ft^2/43,560 ft^2/acre = 0.92 acre per sample.
   c. On Page 2 in Paragraph 1: The paragraph says that a soil amendment layer of 10 percent bentonite will be applied in a layer approximately 3 feet thick. Data Table 6 of the report of *Laboratory Testing Data at Twin Pines Mine* prepared by TTL on 26 November 2019 shows that a 10 percent bentonite to sand ratio will have a hydraulic conductivity of 10^{-7} centimeters per second (cm/s). Paragraph 4 of the Subsurface Continuity of Humate-Bearing Sands in the Surficial Aquifer, Trail Ridge, Georgia in Supporting Document A to the 25 January 2021 submittal say the hydraulic conductivity of the consolidated black sand at the proposed mine site was 3.4 x 10^{-7} to 2.7 x 10^{-8} cm/s. Table 6 of the report of Laboratory Testing Data at Twin Pines Mine shows that a hydraulic conductivity of 10^{-8} cm/s can be achieved with a 12.5 percent bentonite to sand ratio and therefore the bentonite to sand ratio in the Soil Amendment Plan needs to be changed to 12.5 percent.
   d. On Page 2 in Paragraph 2 Bullet 3: According to Page 5 Paragraph 3 of the 12 June 2020 Application for Industrial Groundwater Withdrawal Permit Twin Pines Minerals, LLC' Saunders Demonstration Mine prepared by TTL, routine dewatering of the mine excavation is not expected except under conditions specified in the permit application. Paragraph 3 further says that excavation will be continuous, during wet and dry conditions. The top of Page 2 of the Monitoring and Adaptive Management Plan prepared by TTL on 13 November 2020 says that the water table at the proposed mine site is very shallow, with water depths of only a few feet. Page 5 Paragraph 3 of the Soil Amendment Plan says that the pit will be backfilled to a level approximately 10 feet below the original land surface and that the blended sand/bentonite material will be placed at a level/interval of 7 to 10 feet below the original land surface. Based on what was said in the Adaptive Management Plan it would be expected that the level/interval of 7 to 10 feet below the original land surface would be below the water table in the un-dewatered mine excavation. The soil amendment plan needs to explain how the blended sand/bentonite material will be placed at a

level/interval of 7 to 10 feet below the original land surface below the water table in the mine excavation in a manner that does not allow the bentonite to separate from the sand, or explain how the mine excavation will temporarily be dewatered to allow placement of the blended sand/bentonite material.

e. The Soil Amendment Plan has no provision for monitoring of groundwater levels in the reclaimed mine. The Soil Amendment Plan must propose a groundwater level monitoring plan such as that shown by the proposed piezometer locations shown on figure 9 in the Monitoring and Adaptive Management Plan prepared by TTL on 13 November 2020. Monitoring of groundwater levels must be conducted monthly until groundwater levels are within one foot of groundwater levels shown on Figure 3 of the Monitoring and Adaptive Management Plan. After groundwater levels reach within one foot of groundwater levels shown on Figure 3 groundwater levels may be measured once every six months. The Soil Amendment Plan must include a contingent plan in case groundwater levels in the reclaimed mine are not restored to within one foot of groundwater levels shown on Figure 3. Such a plan may involve installation of a low hydraulic conductivity layer by the injection of bentonite slurry to a level/interval of 7 to 10 feet below the original land surface in closely spaced borings. Other engineered solutions may be feasible. The contingent plan must not be implemented without prior approval from the Georgia Environmental Protection Division.

3. **Exhibit E. Monitoring and Adaptive Management Plan Comments by: Surface Mining Unit**

   a. Exhibit E needs to be placed in the MLUP instead of a separate document.
   b. Rename to Groundwater and Surficial Water Monitoring Plan.
   c. The report must be stamped by a GA Registered PG.
   d. Monitoring of groundwater levels must be conducted monthly until groundwater levels are within one foot of groundwater levels shown on Figure 3. After groundwater levels reach within one foot of groundwater levels shown on Figure 3 groundwater levels may be measured once every six months.
   e. Please add a contingent(cy) plan in case groundwater levels in the reclaimed mine are not restored to within one foot of groundwater levels shown on Figure 3. Such a plan may involve installation of a low hydraulic conductivity layer by the injection of bentonite slurry to a level/interval of 7 to 10 feet below the original land surface in closely spaced borings. Other engineered solutions may be feasible. The contingent plan must not be implemented without prior approval from the Georgia Environmental Protection Division.
   f. In Section 2.0, 2nd Paragraph, the text states the ridge forms a hydrologic divide. Please clarify if it is a surficial and/or groundwater divide.
   g. In Section 2.0, 3rd Paragraph, give the approximate depth of the clay layer.
   h. In Section 3.1.2., 2nd paragraph, give the estimated depths and screen intervals of the shallow and deep piezometers. In the 3rd paragraph – Fig 11 shows the cone of depression to be about 3600 ft long, not 2000.
   i. In Section 3.1.2.b), 1st paragraph, give a brief explanation of why the depths of 50 and 80 feet were chosen.

j. In Section 3.1.2.c), 3rd bullet, add each piezometer that will be resurveyed after installation and before water level measurements are collected.
k. In Section 4.5, add notify the Director "in writing" within 30 days.
l. In Figure 2, add a note stating that Twin Pines does not have access to TIAA property.
m. In Figure 9, PZs-15, 16, 28, 27, and 26 are not shown.
n. In Figure 11, please explain why asymmetrical was used. How was cone of depression calculated? Is this figure needed?
o. In Figure 12, please explain why 51 ft depth was chosen.
p. In Figure 13, please explain why 81 ft depth was chosen for the figure. Please identify at what depth the clay layer is located. Please add a cross-section to show mining area, shallow/deep piezometers, and clay layer.

4. **Provisions Check List and Explanations for Protection of the Environment and Resources of the State Comments by: Surface Mining Unit**

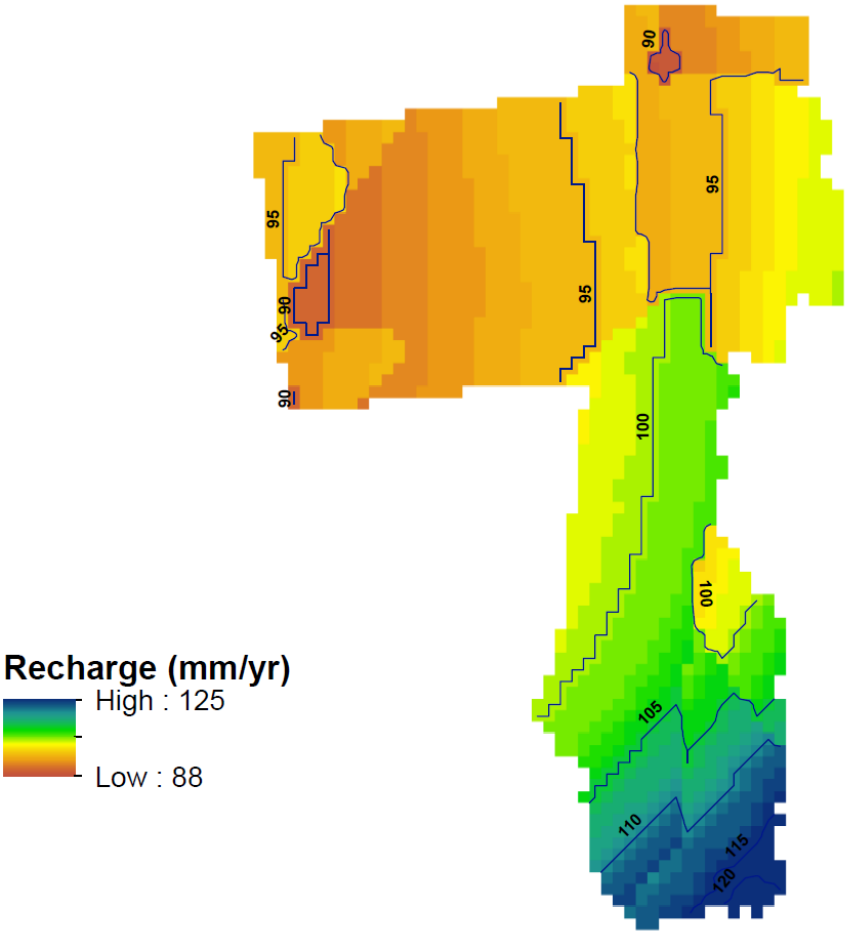
a. Explanations
i. Please note that the Surface Mining Rules Section 391-3-3-.05(1) requests that the Mining Land Use Plan include provisions for protection of the environment and resources of the State. The checklist that was provided to Twin Pines, was taken from GEPA but meant to be used as a guidance for Twin Pines to follow and make their own. EPD is not asking Twin Pines to follow GEPA regulations. The provisions checklist will be an addendum to the Surface Mining Land Use Plan (MLUP) and used during public meetings as an outline of the affects the Twin Pines project may have on the surrounding environment and resources of the State.
ii. Wetlands- Give a brief description of how the non-jurisdictional wetlands will be temporarily affected and then reclaimed.
iii. Flood Plain/River Corridor- Cite the source that was used to determine the claim.
iv. Water Supply- State how the proposed withdrawal is compared to the production capacity of the Floridan Aquifer. Also provide the distance to the nearest known supply well, public or private, completed in the Floridan Aquifer. Will withdrawal from the Floridan Aquifer create a cone of depression that may impact nearby watersheds? If so, this data needs to be provided or pointed to within the MLUP.
v. Water Resources- Please provide an explanation of any potential water quality impacts as a result of the groundwater withdrawal from the Upper Floridan Aquifer.
vi. Groundwater Recharge- No comment.
vii. Stormwater- Please state the name of the receiving stream from the discharge. Provide details of a contingency plan if discharge is greater than pre-mining conditions. Briefly describe erosion/sediment controls at discharge location(s).
viii. Wastewater- Briefly state how the water will be treated and how the effluent will be monitored for permit compliance.
ix. Air Quality- Briefly describe how Twin Pines will minimize particulate/opacity emissions. This area is for the mine boundary as well as the plant.
x. Solid Wastes- The first sentence indicates that process solid waste may be generated but will stay on-site; please clarify what Twin Pines will do with processed solid waste. Second sentence- Please state how the office-related waste will be properly transported and disposed. Can you describe how the land clearing will be handled?

xi. Soil/Stability/Erodibility- Please describe how the site will reduce the potential for sediment-laden soils to leave the site. Briefly describe the berm during mining activities and the deposition of the berm following reclamation.
xii. Protected Mountains- No comment.
xiii. Protected Species- Briefly describe what protected species may be/are present in the area, what surveys were conducted, and if any protected species were found in the proposed mine footprint. Include some of the information that you provided in Exhibit D.
xiv. Critical Habitats- Rephrase to include that the nearest critical habitat identified is the Okefenokee NWR and it's 2.9 miles away.
xv. Historical- Please refer to the Cultural Resources assessment as Exhibit C of the Surface Mining Land Use Plan.
xvi. Archaeological- Please state if there are any known historical/cultural/archaeological resources on the mine property or on the adjacent properties. Please explain what procedures will be followed if these resources are found while mining.
xvii. Parks/Recreation- Please explain "negligible" affects. If there is going to be an affect, please provide a brief explanation and cite applicable sources.
xviii. Energy Supplies- Please state who will run the necessary power lines to supply the operation and state whether the power draw will affect surrounding businesses and/or homeowners or not. If an affect is expected, explain what the affect will be. Please include average projected energy use to verify statement (equivalent to an average household power usage).
xix. Beaches- No Comment
xx. Dunes- No Comment
xxi. Shoreline- No Comment
xxii. Coastal Marshland- No Comment
xxiii. Forest Land- Please provide more information on what types of trees will be planted during reclamation.
xxiv. Barrier Island- No Comment
xxv. Aquatic Life/Trout Streams- Please state that the NPDES discharge limits are designed to be protective of aquatic life and describe how the sampling will ensure water discharge permit compliance.

5. **<u>Technical Response to Review Comments Provided by State Geologist & Supporting Documents Comments by: James L. Kennedy, Ph.D., P.G.</u>**

a. The *Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System* and the *Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine* need to be attached to the MLUP.
b. On Page 4 in Paragraph 7 of the report on the *Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System* prepared by TTL on 14 January 2020 it says that the initial groundwater recharge rate of 4.54 inches per year (in/yr) was applied to the entire upper surface of the model domain. On page 6 of the report it is said that the recharge rate of 4.54 in/yr led to unreasonably high modeled head values. Applying a recharge rate of 2.8 in/yr produced head values near an elevation of 170 ft along the centerline of Trail Ridge. Figure 17 of U.S. Geological Survey (USGS) Circular 1323 (published in 2008) presents

estimated mean annual groundwater recharge in the conterminous United States. The source of data for Figure 17 was USGS Open File Report (OFR) 2003-311. The author of OFR 2003-311 was contacted about specific data for Charlton County, Georgia, and received a map done by a colleague of the author of the recharge rate in Charlton County in millimeters per year (mm/yr):



The location of the proposed mine site has a steady state recharge of 105 mm/yr x 1 in/25.4 mm = 4.13 in/yr. This value is very close to the initial recharge rate of 4.54 in/yr that led to unreasonably high modeled head values. Please identify the part of the model construction (layering, hydraulic properties of layers, boundary conditions) that led to a USGS steady state recharge rate resulting in unreasonably high modeled head values.

c. In the Cover letter, paragraph 2, the statement is made that the 25 January 2021 submittal explains TTL's confidence that soil amendments are not needed everywhere. Comment number 2 of the 25 November 2020 comments says that based on data provided by TTL the consolidated black sand is continuous over 69 percent of the proposed mine site. The statement in the submittal of 25 January 2021 that soil amendments are not needed everywhere is, therefore, unnecessary.

d. In the Cover letter, paragraph 3, the statement is made that while agreeing to add amendments to the soil TTL is concerned the result could be to change, rather than restore, pre-mining hydrology. The statement is unnecessary in that computer groundwater flow modeling of the soil amendments can be done to determine whether pre-mining hydrology will be changed by the soil amendments. A report should be included in the Soil Amendment Plan to document the modeling and where addition of soil amendments may change the pre-mining hydrology.
e. In the Cover letter, paragraph 3, a condition is established if the consolidated black sand layer proves to be less continuous than has been postulated. The continuity of the black sand was not postulated in Comment number 2 of 25 November 2020 comments, the continuity was based on measurement made from real data provided by TTL. This must be clarified in the 25 January 2021 submittal.
f. In Attachment 2, Page 1, Response to Review Comment 1: Comment 2 in the 25 November 2020 comments tabulated TTL data which documented that the consolidated black sands are not continuous across the site. The highlighted blue sentence on Attachment 2 Page 3 states that even with missing 31.0 percent of the cross sections the consolidated black sand is continuous enough to affect the presence of the shallow water table along Trail Ridge. On Attachment 2 Page 3 it is stated that Twin Pines Minerals (TPM) respectfully disagrees with the analysis. Please provide an analysis of the data in the TTL report titled *Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine* (December 11, 2019) that supports TPM's position.
g. For the reasons cited below, please include the consolidated black sands in the model.
    i. In the second paragraph on Page 2 of 19 of Attachment 2 it is said that an examination of Figures 4 – 7 reveals that the consolidated black sands occur as small-scale isolated features within the Surficial Aquifer along Trail Ridge. Comment 2 of the 25 November 2020 comments notes that site borings indicate that the consolidated black sands are continuous over 69 percent of the proposed mine site. In numerous cross sections in the TTL report titled *Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine* the consolidated black sand occurs in adjacent boreholes. Standard geological practice is to connect units that occur in adjacent boreholes as in the boreholes shown on the cross sections in the report titled *Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine*.
    ii. In Attachment 2 on Page 3, Response to Review Comment 2, the statement is made in the 25 November comments that one must assume the consolidated black sand is continuous between the borings since there is no evidence that the consolidated black sand is missing between the borings. The January 25th submittal notes that it is equally true that there is no evidence that consolidated black sand is present between the borings. To be conservative, please assume consolidated black sand is continuous between adjacent borings.
    iii. In Attachment 2 Page 3, Response to Review Comment 3, the statement was made in the submittal of 25 January 2021 that on average, zones of consolidated

black sand are small (e.g., less than 432 ft × 240 ft) when compared to our grid-block size of 495 ft × 503 ft. From this statement one would assume that a layer of consolidated black sand was not included in the model. The statement was also made that the effective hydraulic conductivity in the horizontal direction is best represented by an arithmetic mean and the harmonic mean in the vertical direction. From comment 13 above it appears that materials of the lower hydraulic conductivity layer were not included in the model or were included insufficiently. Consolidated black sand should be included in the model regardless of the geostatistically determined size of the lenses.

iv. In Attachment 2 Page 4, Response to Review Comment 4 and 5, it was noted that in the 25 November 2020 comments that it was not known which model layers were used to depict the layers of black sand and clayey sand. The 25 January 2021 submittal said the TPM respectfully disagrees with this statement. Layers specifically representing consolidated black sand and clayey sand are not included in the model, as continuous layers of consolidated black sand and clayey sand are not present in the subsurface. As stated in Comment 5 above even with missing 31.0 percent of the cross sections the consolidated black sand is continuous enough to affect the presence of the shallow water table along Trail Ridge. Layers of consolidated black sand, whether continuous or discontinuous, need to be incorporated in some form in the model layers. The layer does not need to be continuous across the site, but the layer must have at least 69 percent of the grids representing a hydraulic conductivity of 3.4×10^{-7} to 2.7×10^{-8} cm/sec.

v. In Attachment 2, Page 7, Response to Review Comment 11, TPM say that their data indicate that consolidated black sand is not continuous across the site. The 25 November comments acknowledge that the continuous black sand is not continuous across the site. Analysis of the cross sections in the TTL report titled *Subsurface Lithology of the Surficial Aquifer at Twin Pines Mine* indicate that the consolidated black sand is continuous over 69 percent of the site which is continuous enough to affect the presence of the shallow water table along Trail Ridge as noted in Comment 5.

h. In Attachment 2, Page 8, Response to Review Comment 13 and 14, the comment was made that the sample of black sand should have been reacted with make-up water consisting of rainwater collected from the site. The response was that the purpose of this particular extraction was not to simulate "weathering" of post-process material. The purpose of the extraction should have been to simulate weathering of post-process material as this will be what happens as rainwater infiltrates into the mine spoil as recharge, weathers the mine spoil, and reaches streams as groundwater discharge. The response to Comment 14 gives a lengthy explanation of why rainwater was not chosen as a source. Rainwater should have been chosen as a source because the reclaimed mine interaction with the recharge water (rainwater) is what will affect the chemistry of the groundwater discharge to surface waters. Comment 13 in the 25 November 2020 Comments noted that the report may

provide the chemistry of the Floridan aquifer groundwater used in the tests and the local rainwater. Please provide comments on how the differences in chemistry (if any) would affect the tests. Please include a demonstration of Floridan aquifer groundwater chemistry versus local rainwater chemistry in the report.

6. **Subsurface Continuity of Humate-Bearing Sands in the Surficial Aquifer, Trail Ridge, Georgia Comments by: James L. Kennedy, Ph.D., P.G.**

   a. *Subsurface Continuity of Humate-Bearing Sands in the Surficial Aquifer* needs to be included as an attachment to the MLUP.
   b. A large portion of Page 2 of 19 of Attachment 2 is used to explore the continuity of humate-bearing sands present in the subsurface along Trail Ridge using geo-statistics. Geo-statistics should not be used to explore the continuity of humate-bearing sands as there is sufficient field data to determine the presence or absence of the sands. Please use data to determine presence or absence of the sands.
   c. In the 14 January 2020 report titled *Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System* Figures 32 through 46 give the calibrated model horizontal hydraulic conductivity for Layers 1 through 46. The layers in the project permit area are shown as $<1 \times 10^{-3}$ to $<1 \times 10^{0}$ feet per second (ft/s) in the figure legends. These horizontal hydraulic conductivities are equivalent to $<1 \times 10^{-3}$ ft/s x 30.48 centimeters/foot (cm/ft) = $<3 \times 10^{-2}$ x centimeters per second (cm/s) to $<1 \times 10^{0}$ ft/s x 30.48 cm/ft = $<3 \times 10^{1}$ cm/s. All of the layer calibrated hydraulic conductivities, including those of Layers 1 through 5 where the consolidated black sand should be located, are much larger than the 3.4×10^{-7} to 2.7×10^{-8} cm/sec given in the Supporting Document A document on the Subsurface Continuity of Humate-Bearing Sands in the Surficial Aquifer, Trail Ridge, Georgia. It appears that the calibrated horizontal conductivities of the model layers did not include the layers of low hydraulic conductivity black consolidated sand (whether 69 percent continuous or discontinuous across the proposed mine site). Page 5 Paragraph 3 of the report on the *Impact of the Proposed Twin Pines Mine on the Trail Ridge Hydrologic System* says that hydraulic conductivity values for each soil type were selected to ensure that the vertical and horizontal hydraulic conductivity in grid blocks far from soil boring locations were consistent with those calculated from pumping tests and slug tests (Table 1). The hydraulic conductivities in Table 1 of the report range from 5×10^{-5} to 1×10^{-2} cm sec. The materials listed in Table 1 do not include the consolidated black sand with hydraulic conductivities of 3.4×10^{-7} to 2.7×10^{-8} cm/sec. As referenced in previous sections of this Permit Coordination document, please include the black consolidated sand in the model.

7. **Groundwater Withdrawal Permitting Application Comments by: Bill Frechette and John Ariail**

a. Twin Pines submitted a revised application dated 12-09-2020, requesting a new groundwater withdrawal permit to withdraw up to 1.440 mgd from two wells in the Floridan aquifer.
b. In Section 6 – page 14 of the application and Table 2 – page 9 of attachment B ("An evaluation of drawdown from Floridan wells") lists three scenarios for the total drawdown of the Floridan aquifer at the edge of the Okefenokee National Wildlife Refuge (ONWR), based on pumping two wells at 500 gpm for 4 years.
"The maximum drawdown of the Floridan Aquifer at the edge of the ONWR is 3.8 ft in the Base Case Scenario, 13.2 ft for the Maximum-Drawdown Scenario, and 1.3 feet for the Minimum-Drawdown Scenario."
The application does not quantify the impact to the Surficial aquifer at the edge of the ONWR, as a result of the Floridan aquifer "Maximum-Drawdown Scenario" listed above. Please provide further analysis / detailed modeling to quantify the surficial aquifer drawdown at the edge of the ONWR, based on the Floridan aquifer drawdown numbers provided in the application. This may require a more detailed modeling of the drawdown in the Floridan aquifer, and its associated impact to the Surficial aquifer.
c. Consider possible range of hydraulic conductivity for the aquitard in this analysis. Provide supporting evidence of this range by either literature review or field investigation.